





# DOWN TIME

by **Chad**

## Who wants to be a millionaire

SOME interesting thoughts about Britain's microelectronic future from Daniel Yergin of the Harvard Business School writing about UK taxation and industrial policy in the magazine *New Republic*:

"I sat in on a discussion among influential, committed individuals on the left side of the Labour Party. They were debating microprocessors.

Was Britain to have its own microprocessor industry or not? If it did, then its very existence would involve the possible creation of new British millionaires. They didn't want any new British millionaires since they were still trying to figure out ways to get rid of the old inheriting kind. On the other hand, they admitted, without risking millionaires, such an industry was unlikely to get going in the UK, which would mean that Britain would import its microprocessors from the US — thus creating new American millionaires, or adding to the wealth of the existing American millionaires."

Elizabeth Proctor

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

1978

# MICHIE'S PRIVATEVIEW

## Such is the lure of simplicity



EARLIER Privateviews have mentioned information systems too complex to be comprehended (CW, January 19 and July 20). The human mind responds to complexity with simplifying slogans, at a cost to accuracy which varies from case to case. "When defending with king and rook against king and queen" says the chess-master, "always keep king and rook together" and he does not err. But "With king and knight against king and knight together" is sometimes wrong, and "After 1. P-K4... White's game is in its last throes" is not more than amusing — comparable perhaps to Nancy Mitford's Uncle Matthew on the wider game of life: "Abroad is bloody, and foreigners are f---s."

At no time are the mind's simplifications more active than when under stress of emotion. As a graduate student at Duxford I sat thunderstruck through an altercation at a crowded departmental seminar. Our Reader in Cytology John Baker, subsequently elevated to the Royal Society, was attacking the seminar speaker, none other than Dr J. B. Rhine.

Rhine was founder and director of the Institute of Parapsychology at Duke University, North Carolina, later to be tarnished by the departure of its deputy-director caught in flagrant scientific fraud. But even at that early date Baker, a passionate scientific rationalist, felt that there was a rat to be smelt somewhere.

Grey-suited and manicured, Rhine availed himself of each thrust, scattering a large number of cut remarks. So one might seek with parasol and peanuts to deflect the mighty rhinoceros. John Baker, his voice a clarion, returned to the charge: "When Galileo dropped his balls from the leaning tower of Pisa..." It was enough. We had been stretched, on the rack too long. I still hear the deafening shout of laughter as the hall exploded.

No-one, least of all the normally meticulous John Baker, noticed that he had it all wrong anyway. Galileo did not drop his, or anyone else's balls. He rolled cannon-balls down an inclined plane. Baker had momentarily simplified by confusing this with a weight-dropping demonstration made

earlier by the Dutch engineer Stevens.

When simplifications reside in the phenomena themselves and can without cheating be conjured forth, there lies the gifted experimenter's greatness.

Foucault's coup de theatre in 1851 with a pendulum strung from the ceiling of the Paris Pantheon was of this kind. Michael Pento, Dean of Science at the Open University, has repeated it using the 268-foot high dome of St Paul's. A brass ball of 180 lb weight, set swinging in a 30-foot straight traverse, progressively knocks down a circle of sand on the floor. As the earth rotates beneath it, so the pendulum's swing, by insensible shifts, changes direction and in course of time would move through the complete 360°.

"Aha!" we say, "Of course!" and then "Beautiful!" Such is the lure of simplicity.

But in pursuit of this lure, our minds are prepared to tell us the most extraordinary lies.

Next Privateview will examine one of these, concerning the great astronomer-physicist Galileo.

Rhine was founder and

"Why can't reading, keying, endorsing, microfilming, and processing be handled by one system?"

It can!

One stand-alone system that takes your source documents and directly captures from them the data you need to put into your computer system. This means that you can read pre-printed, imprinted, computer printed, MICR encoded and hand printed characters automatically at high speed and with great accuracy.

One system that allows you to key at the same time that data which cannot be read.

One system — the same system — that

**SCANDATA**  
Scan what you can.  
Key what you can't.

Find out more — ScanData have got the one system you need.

CW 14/9

## SOFTWARE FILE-1

### Altero puts 'one-way flow' of technology from US into reverse

CRACKING the US treasure chest floating in a sea of IBM installations is the dream of many European software and service companies. But the path to that lucrative goal is full of unexpected dangers and pitfalls, even though the end rewards can be great.

Dave Brownlee, who was responsible for establishing the operations of Altergo Software in the US, is a man who has travelled that path and who can honestly admit that, although he made mistakes along the way, he now has no regrets as he sees the company beginning to reap the rewards of its US venture.

"When I first came to America early last year to start our US operations, I was over-optimistic about the speed we could grow nationwide," Brownlee recalled. "It is not possible to grow without having the right people to help you grow. As elsewhere in the computer business, talent in the US is in short supply."

Brownlee points out that the inherently lower cost of software development in the UK means that Altergo Software can afford to have a bigger, higher quality developed team based in Britain.

Both these points relate directly or indirectly to one of the most important features of the US — its sheer geographical size.

Most phone calls are long distance and many client trips involve large air fares and hotel bills. So it is not practical to have the "hand holding" type of personal support which is common in Europe.

Brownlee said the telephone bill alone can be in the region of \$17,000 a month for Altergo. Because of the high expenses, he estimates that each manager costs about \$100,000 a year, each salesman about \$80,000 and each technical support person about \$70,000.

The geographical dispersion has been one of the main factors why the software package industry grew so quickly in the US. Software vendors had to find a way of offering software that could be implemented and maintained with relative ease, and could be as self-sufficient as possible.

Coupled with the lavish way in which the Americans were willing to upgrade hardware, an important side-effect of this has been, according to Brownlee, a trend in US package development towards a "checklist of bells and whistles" approach, rather than aiming at good efficiency and performance, which has been a priority for European software.

This led to important challenges to Altergo's main product, the Shadow II TP monitor for IBM systems.

The need for well packaged software places a stress on documentation. "When we started in the US our documentation, which had been relatively well received in Europe, was only just adequate, at best, for the US market," said Brownlee.

"So we invested a great deal of resources in our first few months of operation in the US in improving documentation to a point which I believe makes it the best in the industry."

Brownlee likes this frank, no-nonsense approach of the Americans. One of the "big differences" between the US and Europe he cites is the way in which a salesman will waste a lot of time in nipping first calls on

the wire.

"The US manager will answer

frankly questions on the size of

the budget and who in the organisation has the final buying power. In Europe, however, the manager often does not know the answer to questions of budget size and likes to pretend that he has the final say, even if he hasn't."

Brownlee points out that the inherently lower cost of software development in the UK means that Altergo Software can afford to have a bigger, higher quality developed team based in Britain.

But he is very clearly in the mould of the American manager

## SOFTWARE FILE -2

### Pentagon to fund first kernelised secure OS

THE US Department of Defence is funding the development of the first kernelised secure operating system. The system, for a PDP-11/70, is intended as a model for the future implementation of similar systems by manufacturers.

Subsequently, the Pentagon expected to be able to buy in systems commercially which would meet its security requirements.

Ford, which is scheduled to deliver KSOS in September 1979, expects to receive the first version of the Euclid compiler from Toronto in about two months.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

Ford, which is scheduled to

deliver KSOS in September 1979,

expects to receive the first ver-

ification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

Ford, which is scheduled to

deliver KSOS in September 1979,

expects to receive the first ver-

ification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware or

gram verification techniques. The availability of a Euclid compiler would thus be of major assistance to the current project.

These systems, he noted, could be implementations of KSOS on other hardware

## HINT OF THE WEEK

**Aligning stationery with sticky labels**

THE alignment of pre-printed stationery on the ICL 1933 printer is the topic of a hint sent by David Leigh, an operator at the Monchster-ster of Covered Cables Ltd.

He says, "Quite often, the operator will spend a lot of time ensuring that the line-up of the stationery is correct.

"Vertical alignment is no problem, because on the left-hand side of the back-plate there is a series of numbers which act as reference points.

"However, horizontal alignment is a different matter, because there is no way of knowing whether the paper is too far to the left or right."

According to Leigh, the problem may be overcome by the use of sticky labels.

He continues, "You can save a lot of time and effort by putting a label on the back-plate of the printer so that its top left-hand corner coincides with that of the form being aligned."

**Coming out TOPS through Control Data**

To get the label in the correct position, reverse the process just described, align the form by means of trial and error, and then attach the label to the backplate of the printer accordingly.

I would like to add another tip relating to the line-up of stationery: when the printer runs short of paper in the middle of producing a listing, simply overlap the first form of the new box-load with the one still on the carriage of the unit — this ensures that the alignment is right and saves a lot of time.

A number of operators have expressed reluctance of submitting hints to Op Spot, because they believe that if they know certain "tricks of the trade" than everyone else will be as well-informed. That is not the case. From my own experience, and from talking to a number of contractors, it is clear that some sites are more technically aware than others. And remember that the hints will be of considerable use to trainees.

According to Leigh, this problem may be overcome by the use of sticky labels.

He continues, "You can save a lot of time and effort by putting a label on the back-plate of the printer so that its top left-hand corner coincides with that of the form being aligned."

MANY persons looking to enter the field of computer operations (or any of the other computing disciplines, for that matter) have only a vague notion of what the work entails and the opportunities that are available.

They might well apply for jobs through the various agencies and, as a result of their keenness and lack of awareness, accept the first position offered to them.

One such company is Control Data Institute, which provides TOPS courses for operators at its training centres in Birmingham, Manchester, Leeds and London. New centres are to be opened at Bristol and Nottingham during September and October respectively.

The CDI operator courses are for persons between the age of 19 and 28 years. Their purpose is

London and throughout the rest of the country.

The MSC comprises an employment services division and training services division: the former, with its job centres and employment offices, is responsible for attracting potential students; and the latter arranges for courses to be run by colleges and companies.

The written selection tests are not to see what aptitudes they have, but to find out whether they have the natural skills necessary to cope with the training. Of those who come along, about 23% actually get through this stage," said Michael O'Connor, sales and services manager at CDI.

The interview is equally strict, as he explained: "During the interview we look to see if they have personality and motivation necessary to make a good operator or programmer. Whether they are sent on the programming or operations course depends upon personality, and not how well they have done in the written test.

"It works out that about nine out of every 100 actually get through both stages of the selection."

According to Chris Thorpe, who is regional instructor manager for the CDI centre outside London, the practical side of the training is extremely valuable in placing students when they finish the course.

He said, "The site visits provide an excellent opportunity for the student and the company concerned to take a good look at each other and to see if they are suitable."

But even if the student has the opportunity to join the company as soon as he has completed his visit, CDI still advises him to complete the course.

Said Thorpe, "we would encourage anyone to drop out of the course at that point. For example, after the two-week period at the ICL installation comes the training on IBM equipment, which is usually two weeks at an IBM installation."

According to O'Connor, CDI has had considerable rate of success since it started holding TOPS courses at the end of 1976.

"Between January of last year and July of this, about 180 of our students successfully completed the training course and have been placed with companies as junior operators," he said.

From 17 who graduated from

in course in the Manchester centre on May 29, 15 were placed with firms within six weeks. Of the two not working as operators, O'Connor said, "One is in hospital and the other went off to Holland, I think."

The record of a course at the Birmingham centre is even better, according to O'Connor.

"That course, which was completed on July 31, had a 100% pass rate. They have all since been employed by companies."

CDI plans to modify the operations course so that the students are given more individual tuition, as opposed to being considered part of a group.

"At the end of the year, we are to reduce the number we take in every six weeks from between 15 and 20, to 10. This will enable us to follow each individual's progress more closely," said O'Connor.

Despite this, the content of the operations course is to

train the students to the level of junior operator with a view to placing them with companies.

The candidates go through a stringent selection process: they attempt a written test and, if successful, go on to an interview. A pretty low percentage actually get through both stages.

These site visits fit in with the rest of the course in a logical manner; after they have seen the ICL hardware and software, they go to a site using the equipment. The same applies to the IBM section.

The written selection tests are not to see what aptitudes they have, but to find out whether they have the natural skills necessary to cope with the training. Of those who come along, about 23% actually get through this stage," said Michael O'Connor, sales and services manager at CDI.

The interview is equally strict, as he explained: "During the interview we look to see if they have personality and motivation necessary to make a good operator or programmer. Whether they are sent on the programming or operations course depends upon personality, and not how well they have done in the written test.

"It works out that about nine out of every 100 actually get through both stages of the selection."

According to O'Connor, CDI has had considerable rate of success since it started holding TOPS courses at the end of 1976.

"Between January of last year and July of this, about 180 of our students successfully completed the training course and have been placed with companies as junior operators," he said.

From 17 who graduated from

in course in the Manchester centre on May 29, 15 were placed with firms within six weeks. Of the two not working as operators, O'Connor said, "One is in hospital and the other went off to Holland, I think."

The record of a course at the Birmingham centre is even better, according to O'Connor.

"That course, which was completed on July 31, had a 100% pass rate. They have all since been employed by companies."

CDI plans to modify the operations course so that the students are given more individual tuition, as opposed to being considered part of a group.

"At the end of the year, we are to reduce the number we take in every six weeks from between 15 and 20, to 10. This will enable us to follow each individual's progress more closely," said O'Connor.

Despite this, the content of the operations course is to

remain the same. It includes appreciation of general topics; training in both IBM and ICL hardware and software; and two periods (both two weeks long) when the students attend an ICL and an IBM site in order to work as part of an operations team.

The written selection tests are not to see what aptitudes they have, but to find out whether they have the natural skills necessary to cope with the training. Of those who come along, about 23% actually get through both stages.

These site visits fit in with the rest of the course in a logical manner; after they have seen the ICL hardware and software, they go to a site using the equipment. The same applies to the IBM section.

The interview is equally strict, as he explained: "During the interview we look to see if they have personality and motivation necessary to make a good operator or programmer. Whether they are sent on the programming or operations course depends upon personality, and not how well they have done in the written test.

"It works out that about nine out of every 100 actually get through both stages of the selection."

According to O'Connor, CDI has had considerable rate of success since it started holding TOPS courses at the end of 1976.

"Between January of last year and July of this, about 180 of our students successfully completed the training course and have been placed with companies as junior operators," he said.

From 17 who graduated from

in course in the Manchester centre on May 29, 15 were placed with firms within six weeks. Of the two not working as operators, O'Connor said, "One is in hospital and the other went off to Holland, I think."

The record of a course at the Birmingham centre is even better, according to O'Connor.

"That course, which was completed on July 31, had a 100% pass rate. They have all since been employed by companies."

CDI plans to modify the operations course so that the students are given more individual tuition, as opposed to being considered part of a group.

"At the end of the year, we are to reduce the number we take in every six weeks from between 15 and 20, to 10. This will enable us to follow each individual's progress more closely," said O'Connor.

Despite this, the content of the operations course is to

**Pilot and computer link-up for fail-safe flying**

THE complexity of modern fighter aircraft is so high that it will shortly become impossible for pilots to fly them without substantial support from computer and associated electronic equipment.

The problem, however, is to find the best method of transferring data at high speeds into a pilot's brain and checking that all parts of the message have been recognised.

Highlighting research he has done on this problem, Carl Sem-Jacobsen, of the EEC Research Institute in Oslo, gave a talk on brain/computer communication at the International Congress of Aerospace Medicine last week.

"Information about man's ability to adapt to changing environments and

data on his requirements in such situations is of paramount importance for present day and future aviation and space travel," he said.

Sem-Jacobsen has been carrying out tests on US Air Force pilots since 1958, and his studies have concentrated on the change in brain waves that signify a particular piece of information has been received and understood as an "evoked response." Recording of these changes is achieved by attaching electrodes to pilots' scalps and using a computer to process the resulting data.

A scenario for the cockpit of the future, he suggests, is that all instruments will be replaced by a VDU screen. The on-board computer would then be able to flash

information to the pilot via this or provide it orally by means of coded signals.

"This information will be given either on the request of the pilot or when information monitored by the computer reaches a threshold point, and the pilot should be alerted," said Sem-Jacobsen.

Safeguards would have to be built in so

that if the pilot did not take full account of the data, the system would inhibit him from making a wrong and possibly catastrophic decision.

"An example could be like this," added Sem-Jacobsen. "The computer gives the pilot 10 different sets of information in sequence, but the busy pilot overlooks four of them. When the pilot wants to take action on the basis of only six sets,

the computer will freeze the controls and flash something like — reconsider, you did not take into consideration these four sets of information which must be considered. The computer then repeats the four unrecognised sets."

Currently, Sem-Jacobsen is conducting similar experiments with North Sea divers who operate submersibles.

"I have used a microprocessor-based system to record and process details of divers' brain wave activity while they carry out work in the North Sea," he said.

"Electrodes are attached to their scalps as with the pilots and information is relayed to the surface via a special cable in the submersible's umbilical."

Further discussion involving

Ferranti and the Confederation of Shipbuilding and Engineering Unions, to which ASTMS is affiliated, has been called for by the union on the reconstruction of the company and the sale of the NEB shares.

**Swift software**

SOFTWARE to enable banks to connect to the Swift international funds transfer network has been developed for the Level 6 minicomputer by CII-Honeywell Bull in France.

**Motorola launches three-chip CMOS-based codec set**

An all-CMOS codec set has been introduced by Motorola to win a share of the booming telecommunications market. A codec encodes and decodes audio signals for digital transmission.

The three-chip set consists of a compressing codec chip which is available now, backed by a filter chip and a linear device that replaces the hybrid transformer normally required in another analogue to digital conversion equipment. The last two will be available early next year.

This codec set is the first to use the CMOS approach. CMOS offers considerable advantages in terms of power consumption and power supply tolerance which could be important in some telecommunications applications.

**HAMILTON RENTALS**

Monthly Rentals f.s. VAT

DIABLO 162114-3900 162114-3901 162114-3902 162114-3903 162114-3904

HEWLETT PACKARD TERMINALS 324-325 324-326 324-327 324-328 324-329

LEAR SIEGLER 304-313 304-314 304-315 304-316

NEWBURY 704-712 704-713

TELETYPE 43 404-413

TEXAS 242-253 242-254 242-255 242-256 242-257

DIGITAL WORD PROCESSOR 242-258 242-259 242-260 242-261 242-262

DIGITAL MINI-COMPUTERS 242-263 242-264 242-265 242-266 242-267

TEKTRONIX GRAPHIC DISPLAY TERMINALS 4006-1 4006-2 4006-3 4006-4 4006-5

HEWLETT PACKARD DESK TOP COMPUTERS 262-263 262-264 262-265 262-266 262-267

262-268 262-269 262-270 262-271 262-272

262-273 262-274 262-275 262-276 262-277

262-278 262-279 262-280 262-281 262-282

262-283 262-284 262-285 262-286 262-287

262-288 262-289 262-290 262-291 262-292

262-293 262-294 262-295 262-296 262-297

262-298 262-299 262-300 262-301 262-302

262-303 262-304 262-305 262-306 262-307

262-308 262-309 262-310 262-311 262-312

262-313 262-314 262-315 262-316 262-317

262-318 262-319 262-320 262-321 262-322

262-323 262-324 262-325 262-326 262-327

262-328 262-329 262-330 262-331 262-332

262-333 262-334 262-335 262-336 262-337



## Control Data appoints three more to the board

THREE new appointments to the board of directors have been announced by Control Data. One is Richard Anderson, UK finance and administration manager. Previously financial controller, he joined the company in 75. Another is Alan Gill, he is plant manager of the magnetic media manufacturing division of Control Data, based in Brynmawr.

Jenson Computer Systems of Bristol has taken on three young people in trainee/junior positions. Richard Gregory, who was doing statistical work as a programmer with the Cardiff Health Authority, has joined the company as a junior programmer. He is on a two-year subbatical from his degree course in Applied Science at the New South Wales Institute of Technology, Australia.

Jerry Lock has also joined Jenson as a trainee programmer. He was studying for his BA in systems analysis at the Bristol Polytechnic. Also to join the company as a junior programmer is Mohammed Shariff. He has an HND in computer studies from Derby College of Technology.

man D. Cooke, Lord Mayor of Belfast, at the finale of the Irish Management Game. The Irish Management Game is sponsored by four companies including ICL.

## Management game chief

THE newly elected chairman of the members' regional committee of the National Computing Centre is Brian Byers, ICL's Northern Ireland manager. Byers (left) was congratulated on his appointment by Alistair



South Wales. Gill joined the company in 77. The third one is Mike McLagan, he joined the company in 70 and is managing director of Control Dataset the Leicestershire-based business products division of Control Data. Before joining Control Data in UK, McLagan has previously spent 11 years with the company in Canada.

Stu Peters has been appointed by Teradyne, a company which manufactures test equipment for electronic components, as director of European Operations, based at Weybridge, Surrey. Since 73, he has been director of Far East Operations of the company's Tokyo-based Japanese subsidiary.

Stephan Stewart and Renul Wynter have been appointed to the board of directors of Data and Research Services, of Millen Keynes. They have been with the company since 72 and 75 respectively. While one vacancy was created by the departure of the US company Westinghouse as a shareholder in DRS, the other vacancy was created by the death of Professor L. Inquist, one of the founders of the company.

Bruh Sarah, appointed marketing manager at Software Development Services, was previously Western district customer engineering manager at Hewlett-Packard.

Michael Jones, who was previously with Digital Equipment Corp, Reading has joined Peter International, Reading, part of the Perfect Computer Corp to operate as inside sales support. Also to join the company is, Round Bowers, as training instructor. He was previously with IBM (Mitsubishi), Slough, as engineering training officer.

Chris Inman, previously managing director of Infotech International, became MD of a new company Infotech Europe, which is based in Holland and will establish a sales office in Europe. Chris Inman, who was formerly director of several events, became Infotech International. He Bates, who recently resigned from the training division, John Sweeney, head of the product division, have been made board directors.

James Williams has been appointed vice-president of sales and control at ICL International London ICL. He will have responsibility for the company's four operations. He succeeds Rob Cudlin, who returns to the UK as one vice-president, finance, the ICL Data Services group. Williams was previously vice-president finance and administration of the field engineering division in the Hugh Parry, who was previously finance director of Telex Computer Products in the UK, has been director of country finance and administration with ICL International.

Martin Carlucci, a past chair of the European Manager Association, has joined Digital's sales consultant in the division and OEM Division. He was previously with GEC Hanley Electronics administration manager.

PC's officers now carry a portable Texas Instruments Silent 700 terminal whenever they go overseas to meet industrialists interested in locating a factory in Peterlee.

The only firm at the moment definitely intending to fabricate 64K devices in the UK is ITT Semiconductors, and although it has not been announced yet the ITT product looks like being a single 5-volt supply device (CW, August 3).

On the question of whether Innos will go ahead with the development of a 64K dynamic RAM, Dr Shroeder said that no definite commitment has been made yet, but that it was being given very serious consideration. It was a product that any company in the Very Large Scale Integration business should consider making.

He expects that 64K RAMs will account for more than a quarter of the billion-dollar MOS sharing network.

"The program was not easy to draw up," said Fred McClellan, PDC's assistant director for industry. "It involves many variables, but the Peterlee industrial team is now operating it very smoothly and we have drawn up a number of additional programs to develop the system further as a sales aid."

Previously, only general examples or incomplete answers could be given.

"Already, a number of industrialists visiting us have had Computer demonstrated to them on their own individual projects," added McClellan, "and they have been very impressed."

At last there is an opportunity for online users in the North West to get together without the expense of a London trip. A Manchester user group has now been formed for new and potential users of International Information systems.

The main aim is for users to meet to exchange information and experience, although speakers and visits will also be included in the program. The first meeting is on September 20 in Room 83 of the Met and Social Science Building, UMIST, Sackville Street, Manchester.

Experienced users from ICL and Unilever will discuss the pros and cons of the different systems as a prelude to a general discussion on the use of online systems. A full programme has been arranged into 1978. Contact the secretary, Mrs Rengely, Mediol School Library, Manchester University or the chairman, Dr P. W. Valentine, Computation Dept, UMIST, PO Box 88, Manchester M60 1QD.

SEPTEMBER 21-22

Seminar on cost/schedule control systems, requirements for participation in US government contracts. Technical Marketing Society of America, Hotel Russell, London WC2. Details, tel 01-242 4045.

SEPTEMBER 21-23

Symposium on interactive techniques in computer design. IEEE Computer Society, Bologna, Italy.

SEPTEMBER 21-22

ISATA '78, automotive technology and automation symposium. ISATA Committee, European motor industry, Congress Centre, Wolfsburg, W. Germany.

SEPTEMBER 21-22

Colloquium on the industrial uses of image processing. IEE Savoy Place, London WC2. Details, tel 01-240 1971 ext 290.

SEPTEMBER 21-22

Seminar on cost/schedule control systems, requirements for participation in US government contracts. Technical Marketing Society of America, Sheraton Hotel, Brooklands, M20 7LS. Details, tel 01-242 4045.

SEPTEMBER 21-23

International computer communication conference. ICCC '78, International Council for Computer Communication, Kyoto, Japan.

SEPTEMBER 21-22

Management Group meeting. IAM Computer Users' Association, Mount Royal Hotel, London W1. Details, Mrs Specials, 01-581 1043.

SEPTEMBER 22

Colloquium on computer aids to software production. IEE, Savoy Place, London WC2. Details, tel 01-240 1971 ext 290.

However, it was felt that there

## Inmos reaction to 64K RAM from TI

THE announcement of a 64K dynamic RAM by Texas Instruments last week does not mean that the UK's Inmos has missed the boat, even though the Notional Enterprise Board-backed firm is unlikely to have such a device on the market before 1981. This is the view of Inmos deputy managing director, Dr Paul Shroeder, who pointed out that the 4K and 16K devices developed by his former employer, Mostek, were both late in the field but still became industry standards.

One of the major features of the TI device, the TMS 4164, is that it is the first 64K dynamic RAM to be announced with a single 5-volt power supply. A 64K device announced earlier by Fujitsu requires two power supplies with different voltages, +7 volts and -2 volts. TI points out that its single supply chip offers considerably lower power dissipation and is more immune to system noise. TI adds that the chip's compact layout for 5-volt only operation results in improved performance.

Performance figures for the TMS 4164 include access times ranging from 100 to 150 nanoseconds with minimum cycle times of 200 to 250 nanoseconds. TI says that sample quantities of the device will be available in the fourth quarter of this year and that volume production is scheduled for the first quarter of 1981.

The only firm at the moment definitely intending to fabricate 64K devices in the UK is ITT Semiconductors, and although it has not been announced yet the ITT product looks like being a single 5-volt supply device (CW, August 3).

## Personal chess move...

International marketing rights for a personal chess computer called Boris have been awarded to the Washington Executive Group in Washington DC.

Produced by Chofitz, of Rockville, Maryland, Boris is based on the Fairchild F8 microprocessor and is programmed for all classic chess moves, including castling, en passant, and queening. It is also programmed for random play, so that the beginner or experienced player will not get the same game twice.

Boris is portable and comes in a walnut case (25 x 8 x 18cm), which encloses a compact chess board and a set of chess pieces, but the player can use his own board and pieces.

Alphanumeric messages are displayed to signify moves or tell the user which colour Boris will play. It can also display chatty phrases.

The cost of the system in the US is \$300, but it is likely to sell for £199 in the UK. It will be available from normal retail outlets. The UK distribution agent is Optimisation, of Bishop's Stortford.



## Dialogue with Zilog

**One day conventions, organised by Cramer Microsystems especially for software houses, systems analysts and consultants.**

London (The Royal Academy of Film and TV Arts, Piccadilly) 10th October  
Manchester (The Playboy Club, Canal Street) 12th October  
Top level speakers from Zilog and Cramer.

### Programme

#### (LUNCH)

#### 3. Software tools for the company that knows the software business

Peter Beckett (Zilog),

John Lythall (Cramer)

Micros that give you a choice of four software families:- COBOL, extended BASIC, FORTRAN and PLZ

#### (TEA)

#### 4. Software applications

Packages developed for commercial use,

Steve Kirk (Software Architects Ltd)

#### 5. Question Time

#### \* Hardware exhibition

\* Complete package of literature

\* Entrance fee £25 (inc. lunch, tea and VAT)

#### BOOK NOW TO MAKE SURE YOU KEEP A GENERATION AHEAD

Please send me  tickets for Dialogue with Zilog in London  Manchester

I enclose cheque  postal order  Please invoice my company

Name:

Company address:

Reply to Jean Sweeney, Cramer Electronics, Cramer Components, Limited, Hawks House, Green Street, Salford-SJ-1, Manchester. Tel: 01-797 7189.

**cramer** MICROSYSTEMS

## Information systems user group

AT last there is an opportunity for online users in the North West to get together without the expense of a London trip. A Manchester user group has now been formed for new and potential users of International Information systems.

The main aim is for users to meet to exchange information and experience, although speakers and visits will also be included in the program. The first meeting is on September 20 in Room 83 of the Met and Social Science Building, UMIST, Sackville Street, Manchester.

Experienced users from ICL and Unilever will discuss the pros and cons of the different systems as a prelude to a general discussion on the use of online systems. A full programme has been arranged into 1978. Contact the secretary, Mrs Rengely, Mediol School Library, Manchester University or the chairman, Dr P. W. Valentine, Computation Dept, UMIST, PO Box 88, Manchester M60 1QD.

SEPTEMBER 21-22

Seminar on cost/schedule control systems, requirements for participation in US government contracts. Technical Marketing Society of America, Hotel Russell, London WC2. Details, tel 01-242 4045.

SEPTEMBER 21-23

Symposium on interactive techniques in computer design. IEEE Computer Society, Bologna, Italy.

SEPTEMBER 21-22

ISATA '78, automotive technology and automation symposium. ISATA Committee, European motor industry, Congress Centre, Wolfsburg, W. Germany.

SEPTEMBER 21-22

Colloquium on the industrial uses of image processing. IEE Savoy Place, London WC2. Details, tel 01-240 1971 ext 290.

SEPTEMBER 21-22

Seminar on cost/schedule control systems, requirements for participation in US government contracts. Technical Marketing Society of America, Sheraton Hotel, Brooklands, M20 7LS. Details, tel 01-242 4045.

SEPTEMBER 21-23

International computer communication conference. ICCC '78, International Council for Computer Communication, Kyoto, Japan.

SEPTEMBER 22

Management Group meeting. IAM Computer Users' Association, Mount Royal Hotel, London W1. Details, Mrs Specials, 01-581 1043.

SEPTEMBER 23

Colloquium on computer aids to software production. IEE, Savoy Place, London WC2. Details, tel 01-240 1971 ext 290.

However, it was felt that there

## Turnkey systems for news wholesalers

USING experience gained in developing and operating its Newspac bureau service, Gamma Associates, the Nottingham-based systems group has introduced News-Key, a range of turnkey systems for wholesale newsagents.

Gamma also announced that the first order for a News-Key 1, has been placed by W. Knight of Northampton.

Based on Digital Equipment DataSystem hardware, News-Key comes in three basic models, all of which can be tailored to individual user's requirements.

About four years ago, Gamma added its Newspac system to its range of services and now has 14 wholesale newsagents subscribing to it.

However, it was felt that there

was demand for a standalone system that could be operated in-house by a wholesale newsagent. He could then determine the best time for processing data, printing out invoices, or other sales details.

The type of information contained in the News-Key 1 database is details of customers, orders, publishers, and publications, and the mix of such information is entirely up to the user.

A typical News-Key 1 system can include a DEC DataSystem 320 processor with 64K main memory, two 5 Mbyte disc drives, a 300 lpm printer and two VDUs. However, up to four VDUs can be supported by the system. Eight terminals can be supported by News-Key 2, and 32 on the News-Key 3.

Cost of the systems ranges from £22,928 to £38,508.

We don't make mainframes at ITT. Using over half a century's experience in telecommunications, we make the means of talking with them. A highly sophisticated range of peripherals, with the competitive prices and service facilities that only a big company can offer. We also produce private switchboards and message switching systems, many of them built around micro-processors. You can rent, lease or buy directly from us. And for all our equipment we have nationwide customer servicing with experts in every field. They're very fast and seldom necessary. Get in touch with our Sales Information Department soon—there's still a whole lot more you should know.

It'll soon convince you where the answer lies.

Sales Information Department, Hollingbury, Brighton BN1 8AN. 0273-507111.

**ITT Business Systems** 

**LYME**

The New British manufacturer of low cost (E645 one of End User) high quality, high specification VDU Terminals  
TEL: 01-452 0490

Contact  
**Steve Bass**

**Promodata**

LEASING? BUYING? SELLING?  
IBM EQUIPMENT

TEL: 01-499 7507 or 061-439 8931

EARLY DELIVERY FOR SALE, LEASE OR RENT OF NEW

**PDP 11/03**

with twin single or dual density floppy disks (500 K bytes or 1000 K bytes) or Twin RLO1 disks (10M bytes)

Standard Software Packages for STOCK, PRODUCTION, INVOICING, PAYROLL AND ALL ACCOUNTANCY FUNCTIONS.

**data-J**

Date-J Ltd., 7 Churchill Court, Rustington, Sussex  
Tel: 09062-72902

**COMPUTER FLOOR**  
Refurbishing by**CENTRAL FLOORING LTD.**

Apadale Road  
Chesterfield, Newcastle  
Staffs Tel: 0782 561467  
Telex: 362500 FLOOR

**"CEN-GRIP"**

Carpeted Floor Panel Lifters Pat.  
Application No. 36479/76

**USED DP EQUIPMENT**  
BUY, SELL, LEASE

Knowledge of US and European Markets  
Write or Telephone  
**JORDAN HALPER**  
CEDAR COTTAGE  
THE DRIVE  
CHICHESTER, SUSSEX  
0243-527 494

**FOR SALE**

ICL computer equipment, now obsolete, suitable for parts or educational purposes includes 7020 remote batch terminal consisting of P/tape reader, card reader, printer, teletype and also model 4420/2 EDS 30 disc drivers

Offer to G. Lovejoy on Bracknell 26767

**FOR SALE**

ICL 1901A COMPUTER SYSTEM COMPRISING  
10K CENTRAL PROCESSOR  
300 cpm CARO READER  
300 lpm LINE PRINTER  
2 x TWIN EOS DISC UNITS  
CONSOLE TYPEWRITER  
30 x TWIN EOS DISC PACKS

Offers in writing to:

FINANCE OFFICER, PRESTON POLYTECHNIC  
CORPORATION STREET, PRESTON, PR1 2TQ

**PDP 8 AND PDP 11 USERS**

We buy and sell all types of DEC hardware  
New and used systems, processors, peripherals and modules in stock for quick delivery  
Current stock includes 11-46, 11-35, 11-20, 8M, 8E, RP03, RP05, DL10, DH11, TU10, RP05...

Contact David Slieter or Peter Stock  
Decrade Ltd., 11 Musters Road, West Bridgford  
Nottingham. Telephone (0602) 891774

**DDT DDT DDT**

DATA DESIGN TECHNIQUES LTD.  
AUTHORISED DISTRIBUTORS FOR

D.E.C. LA36 from £800  
TALLY T1602 from £1,450. LS120 from £1,900  
TELETYPE Also £1,800  
ASR33 from £800 MODEL 43 from £840

"CHECKOUT" OUR DISCOUNT '78

SIRMINGHAM CHEPSTOW LDN GLASGOW  
021-499 8988 0292 2193 01-207 1717 041-221 8761

DDT DDT DDT

Contract Staff available  
for Home and Overseas assignments  
**01 680 2400**

Metra Lowndes-Ajax  
17 Lansdowne Road, Croydon CR0 2BX  
We are always interested in hearing from people who wish to work on a contract basis.

**market place**

WANTED  
PROGRAM  
ANALYSTS

**DEC DEC DEC DEC**

PDP11/04 and 11/34 Systems and Peripherals for immediate delivery.  
Also various Refurbished PDP8 and 11 Systems, and Modules from stock.

\*\* SEPTEMBER OFFER \*\*

PDP-8I 8K Fully Refurbished, £1,200.

S.K. SYSTEMS LTD.

Stevenage Road, Hitchin, Herts.

Tel: (0492) 52597

Telex: 529715 S.K. SYS.

Available for lease Jan. '79  
370/158 - K00/U34  
5 channels ISC (2150, 2151, 6111)  
and 3213

CONTACT US TODAY FOR MORE INFORMATION

INTERNATIONAL BROKERAGE AND  
LEASING IBL (Computers) Ltd.  
INDEX HOUSE  
HIGH STREET  
ABINGDON  
BERKSHIRE OX15 7JF  
Telephone: 0865-22244, 1444, 547722

IBL

**COMPUTERS-PERIPHERALS****ETC.****IN - OUT**

WE BUY - WE SELL

HARD CASH -

... or for anything...  
... or for anything...  
... or for anything...

Phone: READING 0704 566419

7/9 Arthur Road, Reading

UNITED KINGDOM

PHONE

01-242 9283

01-836 0355

Time and People Limited

tap

SERVICE BUREAU  
Central London  
Providing Batch, DTR, DTE, Data  
links for DTS and DDC users  
at attractive rates.

UNITED KINGDOM

PHONE

01-242 9283

01-836 0355

Time and People Limited

Buffereo/Editing Model with direct cursor  
addressing, dual memory buffer, alphanumeric keyboard  
with separate numeric and edit clusters.

H1000 ONLY £350

H1200 ONLY £425

H2000 ONLY £495

# market place

STUART MOORE  
DIRECTOR OF ANALYSIS  
OPINION

advertising rates  
PHONE 01-261 8757

## WANTED!

IBM 3963

Switching Unit Reg.

Box 19

A-1197 Wian

Telex 07-6272

## PDP8 SYSTEMS FOR SALE

SURPLUS TO REQUIREMENTS

4K PDP8/E, TELETYPE

FAST PAPER TAPE READER/PUNCH £2,000

4K PDP8/E, TELETYPE

FAST PAPER TAPE READER £1,750

BDTH SYSTEMS MAINTAINED UNDER DEC CONTRACTS

AND IN DAILY USE.

APPLY TO:

County Supplies Officer, Commercial Road, Reading

or

Director of Education (for the attention of Mr. Kanyon)

Kennet House, 8D-82 King's Road, Reading

## FOR SALE

113M Peripheral Industry 330/11  
2821/2 + 1403/No. 1

2303/1 + 2 1100 2401-2

Also ICL 2813 EDS 30

Olac's ICL 72 Printer Puncher

To purchase IBM 370 138

IBM 370/135, 512K

IBM 270/256, 256K

We also require peripherals

RELIANCE COMPUTER GROUP LTD.

79 Commercial Road, Sheffield  
Tel: 0742 606251

## COMPUTER WANTED

Interested in purchasing an IBM 32, System Unit 120 CPS B1 5.0 MB (220v 50 cycles) — or similar type of machine.

Kindly contact Mrs. F. Tobler, Tel. (022) 28 67 68, Telex: 23 994 or write to: F.P.C.A., International Division, 6 rue de Riva, 1204 Geneva — CH.

## LETTERS TO THE EDITOR

### Computers 'not nearly independent enough'

THE VIRTUES of a free, uncensored Press, with access by all shades of opinion, are well illustrated by the issue of August 31. I refer to the differing views on human-like aspects of computers, and their effect on the future of mankind, from Donald Michie and Christopher Hodder Williams.

Professor Michie is afraid of computers getting too intelligent and will hence make mankind irrelevant, whereas Mr Hodder Williams thinks that human-like computers will take over just because they are human-like. Unfortunately, Mr Hodder Williams has a point.

In evolutionary theory, which is not restricted to biochemical beings, two competing organisms cannot occupy the same ecological niche for any length of time; hence in the intellectual environment, sufficiently human-like computers will either displace mankind, or die out, or adapt — to inseparability? But Mr Hodder Williams is surely being a bit alarmist — computers are just not nearly independent enough, nor will be for long time, for this to matter.

On a more practical level, one wonders what we need human-like computers for: we have 5 billion already and they can hardly all be fed properly as it is. To err is human; we need something different to help us.

Such as English?

S. KEERY

Baron, Herts.

### KPG sets up firm in States

THE major market potential of its Solitaire small business system in the US has led systems and software house KPG to set up US subsidiary in Georgia. KPG Inc is at the same time negotiating with several US manufacturers with a view to implementing its software on their systems.

David Turnbull, head of the US operation, said that Solitaire represented at the moment a unique offering in the American market-place, combining a wide range of end-user oriented application packages on a low-cost business microcomputer.

The system was also notable, he added, for supporting both word-processing and commercial data processing in a single set of hardware.

Packages being converted by the company for the US included a retail store system and billing systems for legal and dental practices. The company could also offer Solitaire accounting packages to US standards, he said.

Developed, according to the company, at a six-figure cost over the last two years, the Solitaire is based on three Intel 8080s (CW, November 24, 1977) and also uses Ontel equipment. A system including a Diablo printer and half-megabyte of floppy disk cells in the UK for under £10,000 and would be sold in the US for around \$16,000.

A key feature of the system, of which more than 20 have sold in the UK, is a specially developed stand-alone Basic interpreter and operating system.

### Call for papers

A CALL for papers for Specification of Reliable Software, a conference to be held on April 3-6, 1979 in Cambridge, Massachusetts, has been issued by the organisers, the Technical Committee on Software Engineering of the IEEE Computer Society. Deadline for submission of papers is November 1. Details from Marvin Zelkowitz, Dept. of Computer Science, University of Maryland, College Park, MD 20742, tel: (301) 404-3241.

### FOR SALE

IBM 029's, 059's,

P129's

Sorter/interpreters

Wanted: used disc

packs and any other

used equipments

Tell: 01-622 7545

For further details contact

Tony Golomb

Systems Designers Limited

Systems House

57-61 High Street

Frimley, Surrey GU16 8JL

Tel: Camberley (0327) 834

This means that you can split the functions of an operating system, and make the normally serial data flows external on the ring. The ring at Cambridge



## COMPUTER FINANCING

Specialists in new and used IBM Computers

STANBROOK HOUSE, 2-5 OLD BOND STREET, LONDON

W1X 3TB

Telephone: 01-491 4153 & 01-499 7955, Telex: 268048

### DEC 11/70 COMPLETE SYSTEMS AT SUPERB PRICES!

**FAST DEC!**

FROM  
SYSTEK

22 NEWMAN STREET  
LONDON W1P 3HB  
01-586 3026/657 9696  
TELEX YOUR SPEC: 261960

**MARYLEBONE, W.1**  
Furnished Flat  
1 bed./living room  
plus kitchen and bath.  
Sleep 1/2. Phone.  
6-month let. £200 per  
month inclusive. Suit  
computer professional.  
01-486 5644

### FOR SALE

IBM 029's, 059's,

P129's

Sorter/interpreters

Wanted: used disc

packs and any other

used equipments

Tell: 01-622 7545

## IBM 370 CORAL 66

### Provides

- \* Cross compilation to micro and mini
- \* Full 'official' definition CORAL
- \* Fully supported
- \* Program portability
- \* Efficient code generation
- \* Links to FORTRAN libraries
- \* Extensive error recovery and diagnosis
- \* MASCOT language features

For further details contact  
Tony Golomb  
Systems Designers Limited  
Systems House  
57-61 High Street  
Frimley, Surrey GU16 8JL  
Tel: Camberley (0327) 834

This means that you can split the functions of an operating system, and make the normally serial data flows external on the ring. The ring at Cambridge

## TIM PALMER REPORTS FROM NEWCASTLE ON THE IBM SEMINAR

### Need to retrain systems designers to meet demands of trade unions



### Professor challenged by one of his peers

A UNIVERSITY professor is

never more exposed than when

facing a gathering of his peers.

Professor Erich Neuhold,

describing Porel, a distributed

database system being built at

Stuttgart University, was

immediately challenged by Pro-

fessor Dijkstra on his statement

that data should be stored close

to where it is most frequently

used.

He conceded Professor Dijk-

stra's contention that the

criterion for location should be

most urgent need as well as

most frequent use, whereupon

Professor Euan Page of New-

castle interjected that the two

were mutually incompatible;

one was based on forecasts of

the future and the other on his-

story.

"That is why designing a dis-

tributed system is so difficult,"

smiled Professor Neuhold.

### Plus Other Benefits

Valuable disk space savings is only one of several other benefits you realise with CA-DYNAM/D.

For example, you can count on an immediate and measurable increase in throughput. Aborted or bypassed jobs are eliminated. Programmer productivity goes up because there's no longer any need to map disk file addresses.

Or keep track of file size or other attributes. File security, too, is improved.

CA-DYNAM/D has a number of other features that help make it the fastest selling Disk Space and Catalog Management System sold today.

It's available to you entirely without obligation for a 30-day trial evaluation. Just call us or send the coupon today!

### COMPUTER ASSOCIATES

David Torn,  
Computer Associates  
(U.K.) Ltd.  
Park House,  
Park Street,  
Maidenhead, Berks,  
Tel: (0628) 30816

### New insights into design of operating systems

A LOCAL area computer net-

work at Cambridge University is

providing new insights into the

design and working of operating

systems.

Very little work has been

done on measuring the internal

data rates of computers, but the

data rates in a local area ring

are very comparable

with those occurring within a

computer running under a

general purpose operating sys-

tem. Dr Roger Needham, of the

Cambridge Computer Labora-

tory, told the Newcastle semi-

nary that the ring is a

station capable of supporting

any device at each repeater.

Identify, the station should con-

sist of no more than two chips.

He recommended that the addres-

ses of services offered on the

network and that services should

be looked up by name rather than association.

tragedies resulting from this.

The problem lies not in

training lay people in computer

science; all they need to

understand is the impact of a system

on the work environment. The



## COGARVIEW

# We are displacing people in the jobs that they are happy doing —

THE computer industry seems to be in an unusual measure of agreement that 1977 was a great year, 1978 will turn out to have been even better and that 1979 is shaping up as the hottest 12 months in the industry's history.

The mainframe manufacturers don't seem to have been impacted by IBM's flurry of price cuts and new models; the minicomputer makers seem to be surviving the threat from Series 1 on the one hand and microprocessors on the other without difficulty; the plug-compatible firms are viewing the 303X line with, at least public, unconcern.

Yet we are told by the economists that we are failing to

emerge from a dire recession, and by the unions that companies fail to invest in fueling a potentially dangerous level of unemployment that could lead to the collapse of Western civilisation as we know it.

All of which confirms the impression as many of us have had that the computer industry profits from recession as much as the arms industry profits from war.

The fact, unpalatable for some, is that computers are the clear, anti-inflationary investment any company can make.

Take West Germany, for

example, where it has recently been calculated that the average cost of employing someone in 1980 will be just under \$20,000, a figure which includes, of course, all those Turkish road sweepers and Yugoslav chambermaids. Obviously if you can buy a machine for \$20,000 which will mean employing two people instead of three, you buy the machine and turn a healthy profit from the deal in 1981.

Of course, computers are creating unemployment. I cannot understand why there should be such controversy over this point. Is it because we are reacting. And their resistance to labour flexibility helped to make capital intensiveness preferable to

labour intensiveness — a reversal of the historic relationship between the two.

Once upon a time labour forces were handled very flexibly by companies. If my workload as an employer increased, I hired extra people to cope with it. If it decreased, I fired enough people to restore equilibrium. On the other hand, if I bought a machine I had to continue bearing the cost of that machine whether it was in use or not. Obviously it was preferable to hire and fire people.

Today, almost everywhere in the developed world, the reverse is true. In some Western countries like Italy or Belgium, it is virtually impossible to lay people off at all. In others, it is very expensive and the legislation in relation to redundancy changes all the time.

Just as the trade unions are

ad hoc policies to deal with problems as they become acute,

computer manufacturers have consistently taken the easy path, producing the system that could be configured with the least effort, equipped with the software that was easiest to write.

The new processors are built up out of bit-slice micros and were designed around a new Tymnet-developed operating system called Isis. Internally,

the company has recently introduced another catalogue,

with 60 program titles, and has formed a distribution agreement with the distributors of the Pet hardware around the country.

As much of the software the company now sells is coming from individuals and companies using the system, rather than from Commodore itself, Allison

has argued before in this column and elsewhere that methodology is needed to prevent the waste of technical resources and derive optimum benefit from what we already have; perhaps the counterpart to this should be a political and economic methodology to work out some global application priorities.

I have no figures, but I will be willing to bet that the portion of all R&D money spent on robotics is infinitesimal, at least some of the jobs we are going to become socially unacceptable. Involve relatively predictable sequences of activities which are proof within the grasp of existing technology. If properly applied, others, of course, are not. It is presumably to be many years before we see the first robotics.

For that matter, how much money is being devoted to the leisure contribution computers might make to alleviating the unemployment they cause?

There are, to be sure, a few experiments in the field of electronic music, and wireless communications which have an eventual relevance to their social dimension is quite coincidental. Yet it becomes a cliché, at least among computer people, that we all have to develop an enormous capacity for leisure in the future.

Such unpredictability makes business life impossible. If I hire someone today, I have only the vaguest notion of what it might cost me to lay him off, or maintain him in idleness, a year or two hence. On the other hand, if I buy a machine to do his job, no one is going to tell me that I cannot sell that machine off if I cease to need it, or that I will have to pay a special tax on it if it stands idle. I know the capital cost of the machine to start with.

No trade union official is going to come and tell me in 12 months' time that the cost has suddenly gone up. I have a shrewd idea of what I can get for it if I have to get rid of it after two, three or four years. This is a basic on which I can plan. The labour market today provides no such assurances.

However, that's enough trade union bashing on my part. If the unions are economically shortsighted, is not the computer industry equally so?

It is, for instance, a feature of the present chronically high levels of unemployment in the West that they are selective rather than across-the-board. While there are long queues of skilled workers at the dole counter, there are also long lists of unfilled vacancies at the job centres.

What is happening is that certain classes of job are developing that no one wants to do — at any price. The jobs which are short are those which many people would be happy to do. It's a fair prediction that the list of socially unacceptable jobs will lengthen in something like proportion to the percentage of the population who go on to further education.

In Sweden, for example, it is reckoned that 75 per cent of workers will have post-High School qualifications of some

sort by the end of the century. Who wants a diploma to dugdins?

But has the computer industry had the social and economic foresightedness to predict impasse and cater for it? Not. The vast majority of computers, micro and systems we implement are designed to displace people in the very kinds of jobs the people are happy doing — clerical and administrative work. You don't find many computers hewing coal, emptying drains, cleaning sewers or making beds.

Tymshare is implementing the new processor to the UK Post Office as an alternative to the French Transpac and US Telenet microprocessor-based X25 switches for the forthcoming UK Pocket Switched Service which will succeed EPSS. So far, the Post Office has shown little interest, despite an offer from Tymshare to build the engines in the UK if local manufacture is an issue.

The new processors are built up out of bit-slice micros and were designed around a new Tymnet-developed operating system called Isis. Internally,

the company has recently introduced another catalogue,

with 60 program titles, and has formed a distribution agreement with the distributors of the Pet hardware around the country.

As much of the software the company now sells is coming from individuals and companies using the system, rather than from Commodore itself, Allison

has argued before in this column and elsewhere that methodology is needed to prevent the waste of technical resources and derive optimum benefit from what we already have; perhaps the counterpart to this should be a political and economic methodology to work out some global application priorities.

I have no figures, but I will be willing to bet that the portion of all R&D money spent on robotics is infinitesimal, at least some of the jobs we are going to become socially unacceptable. Involve relatively predictable sequences of activities which are proof within the grasp of existing technology. If properly applied, others, of course, are not. It is presumably to be many years before we see the first robotics.

For that matter, how much money is being devoted to the leisure contribution computers might make to alleviating the unemployment they cause?

There are, to be sure, a few experiments in the field of electronic music, and wireless communications which have an eventual relevance to their social dimension is quite coincidental. Yet it becomes a cliché, at least among computer people, that we all have to develop an enormous capacity for leisure in the future.

Such unpredictability makes business life impossible. If I hire someone today, I have only the vaguest notion of what it might cost me to lay him off, or maintain him in idleness, a year or two hence. On the other hand, if I buy a machine to do his job, no one is going to tell me that I cannot sell that machine off if I cease to need it, or that I will have to pay a special tax on it if it stands idle. I know the capital cost of the machine to start with.

No trade union official is going to come and tell me in 12 months' time that the cost has suddenly gone up. I have a shrewd idea of what I can get for it if I have to get rid of it after two, three or four years. This is a basic on which I can plan. The labour market today provides no such assurances.

However, that's enough trade union bashing on my part. If the unions are economically shortsighted, is not the computer industry equally so?

It is, for instance, a feature of the present chronically high levels of unemployment in the West that they are selective rather than across-the-board. While there are long queues of skilled workers at the dole counter, there are also long lists of unfilled vacancies at the job centres.

What is happening is that certain classes of job are developing that no one wants to do — at any price. The jobs which are short are those which many people would be happy to do. It's a fair prediction that the list of socially unacceptable jobs will lengthen in something like proportion to the percentage of the population who go on to further education.

In Sweden, for example, it is reckoned that 75 per cent of workers will have post-High School qualifications of some

sort by the end of the century. Who wants a diploma to dugdins?

But has the computer industry had the social and economic foresightedness to predict impasse and cater for it? Not. The vast majority of computers, micro and systems we implement are designed to displace people in the very kinds of jobs the people are happy doing — clerical and administrative work. You don't find many computers hewing coal, emptying drains, cleaning sewers or making beds.

Tymshare is implementing the new processor to the UK Post Office as an alternative to the French Transpac and US Telenet microprocessor-based X25 switches for the forthcoming UK Pocket Switched Service which will succeed EPSS. So far, the Post Office has shown little interest, despite an offer from Tymshare to build the engines in the UK if local manufacture is an issue.

The new processors are built up out of bit-slice micros and were designed around a new Tymnet-developed operating system called Isis. Internally,

the company has recently introduced another catalogue,

with 60 program titles, and has formed a distribution agreement with the distributors of the Pet hardware around the country.

As much of the software the company now sells is coming from individuals and companies using the system, rather than from Commodore itself, Allison

has argued before in this column and elsewhere that methodology is needed to prevent the waste of technical resources and derive optimum benefit from what we already have; perhaps the counterpart to this should be a political and economic methodology to work out some global application priorities.

I have no figures, but I will be willing to bet that the portion of all R&D money spent on robotics is infinitesimal, at least some of the jobs we are going to become socially unacceptable. Involve relatively predictable sequences of activities which are proof within the grasp of existing technology. If properly applied, others, of course, are not. It is presumably to be many years before we see the first robotics.

For that matter, how much money is being devoted to the leisure contribution computers might make to alleviating the unemployment they cause?

There are, to be sure, a few experiments in the field of electronic music, and wireless communications which have an eventual relevance to their social dimension is quite coincidental. Yet it becomes a cliché, at least among computer people, that we all have to develop an enormous capacity for leisure in the future.

Such unpredictability makes business life impossible. If I hire someone today, I have only the vaguest notion of what it might cost me to lay him off, or maintain him in idleness, a year or two hence. On the other hand, if I buy a machine to do his job, no one is going to tell me that I cannot sell that machine off if I cease to need it, or that I will have to pay a special tax on it if it stands idle. I know the capital cost of the machine to start with.

No trade union official is going to come and tell me in 12 months' time that the cost has suddenly gone up. I have a shrewd idea of what I can get for it if I have to get rid of it after two, three or four years. This is a basic on which I can plan. The labour market today provides no such assurances.

However, that's enough trade union bashing on my part. If the unions are economically shortsighted, is not the computer industry equally so?

It is, for instance, a feature of the present chronically high levels of unemployment in the West that they are selective rather than across-the-board. While there are long queues of skilled workers at the dole counter, there are also long lists of unfilled vacancies at the job centres.

What is happening is that certain classes of job are developing that no one wants to do — at any price. The jobs which are short are those which many people would be happy to do. It's a fair prediction that the list of socially unacceptable jobs will lengthen in something like proportion to the percentage of the population who go on to further education.

In Sweden, for example, it is reckoned that 75 per cent of workers will have post-High School qualifications of some

sort by the end of the century. Who wants a diploma to dugdins?

But has the computer industry had the social and economic foresightedness to predict impasse and cater for it? Not. The vast majority of computers, micro and systems we implement are designed to displace people in the very kinds of jobs the people are happy doing — clerical and administrative work. You don't find many computers hewing coal, emptying drains, cleaning sewers or making beds.

Tymshare is implementing the new processor to the UK Post Office as an alternative to the French Transpac and US Telenet microprocessor-based X25 switches for the forthcoming UK Pocket Switched Service which will succeed EPSS. So far, the Post Office has shown little interest, despite an offer from Tymshare to build the engines in the UK if local manufacture is an issue.

The new processors are built up out of bit-slice micros and were designed around a new Tymnet-developed operating system called Isis. Internally,

the company has recently introduced another catalogue,

with 60 program titles, and has formed a distribution agreement with the distributors of the Pet hardware around the country.

As much of the software the company now sells is coming from individuals and companies using the system, rather than from Commodore itself, Allison

has argued before in this column and elsewhere that methodology is needed to prevent the waste of technical resources and derive optimum benefit from what we already have; perhaps the counterpart to this should be a political and economic methodology to work out some global application priorities.

I have no figures, but I will be willing to bet that the portion of all R&D money spent on robotics is infinitesimal, at least some of the jobs we are going to become socially unacceptable. Involve relatively predictable sequences of activities which are proof within the grasp of existing technology. If properly applied, others, of course, are not. It is presumably to be many years before we see the first robotics.

For that matter, how much money is being devoted to the leisure contribution computers might make to alleviating the unemployment they cause?

There are, to be sure, a few experiments in the field of electronic music, and wireless communications which have an eventual relevance to their social dimension is quite coincidental. Yet it becomes a cliché, at least among computer people, that we all have to develop an enormous capacity for leisure in the future.

Such unpredictability makes business life impossible. If I hire someone today, I have only the vaguest notion of what it might cost me to lay him off, or maintain him in idleness, a year or two hence. On the other hand, if I buy a machine to do his job, no one is going to tell me that I cannot sell that machine off if I cease to need it, or that I will have to pay a special tax on it if it stands idle. I know the capital cost of the machine to start with.

No trade union official is going to come and tell me in 12 months' time that the cost has suddenly gone up. I have a shrewd idea of what I can get for it if I have to get rid of it after two, three or four years. This is a basic on which I can plan. The labour market today provides no such assurances.

However, that's enough trade union bashing on my part. If the unions are economically shortsighted, is not the computer industry equally so?

It is, for instance, a feature of the present chronically high levels of unemployment in the West that they are selective rather than across-the-board. While there are long queues of skilled workers at the dole counter, there are also long lists of unfilled vacancies at the job centres.

What is happening is that certain classes of job are developing that no one wants to do — at any price. The jobs which are short are those which many people would be happy to do. It's a fair prediction that the list of socially unacceptable jobs will lengthen in something like proportion to the percentage of the population who go on to further education.

In Sweden, for example, it is reckoned that 75 per cent of workers will have post-High School qualifications of some

sort by the end of the century. Who wants a diploma to dugdins?

But has the computer industry had the social and economic foresightedness to predict impasse and cater for it? Not. The vast majority of computers, micro and systems we implement are designed to displace people in the very kinds of jobs the people are happy doing — clerical and administrative work. You don't find many computers hewing coal, emptying drains, cleaning sewers or making beds.

Tymshare is implementing the new processor to the UK Post Office as an alternative to the French Transpac and US Telenet microprocessor-based X25 switches for the forthcoming UK Pocket Switched Service which will succeed EPSS. So far, the Post Office has shown little interest, despite an offer from Tymshare to build the engines in the UK if local manufacture is an issue.

The new processors are built up out of bit-slice micros and were designed around a new Tymnet-developed operating system called Isis. Internally,

the company has recently introduced another catalogue,

with 60 program titles, and has formed a distribution agreement with the distributors of the Pet hardware around the country.

As much of the software the company now sells is coming from individuals and companies using the system, rather than from Commodore itself, Allison

has argued before in this column and elsewhere that methodology is needed to prevent the waste of technical resources and derive optimum benefit from what we already have; perhaps the counterpart to this should be a political and economic methodology to work out some global application priorities.

I have no figures, but I will be willing to bet that the portion of all R&D money spent on robotics is infinitesimal, at least some of the jobs we are going to become socially unacceptable. Involve relatively predictable sequences of activities which are proof within the grasp of existing technology. If properly applied, others, of course, are not. It is presumably to be many years before we see the first robotics.

For that matter, how much money is being devoted to the leisure contribution computers might make to alleviating the unemployment they cause?

There are, to be sure, a few experiments in the field of electronic music, and wireless communications which have an eventual relevance to their social dimension is quite coincidental. Yet it becomes a cliché, at least among computer people, that we all have to develop an enormous capacity for leisure in the future.

Such unpredictability makes business life impossible. If I hire someone today, I have only the vaguest notion of what it might cost me to lay him off, or maintain him in idleness, a year or two hence. On the other hand, if I buy a machine to do his job, no one is going to tell me that I cannot sell that machine off if I cease to need it, or that I will have to pay a special tax on it if it stands idle. I know the capital cost of the machine to start with.

No trade union official is going to come and tell me in 12 months' time that the cost has suddenly gone up. I have a shrewd idea of what I can get for it if I have to get rid of it after two, three or four years. This is a basic on which I can plan. The labour market today provides no such assurances.

However, that's enough trade union bashing on my part. If the unions are economically shortsighted



## COBOL PROGRAMMERS

## City £5000 + Mortgage

A major financial organisation based in the city wishes to recruit a number of capable programmers to join their rapidly expanding DP department. The company is interested in programmers with a minimum of one year's experience preferably on ICL equipment.

The hardware in use is the ICL 1900 range running under GEORGE II but plans are well advanced for an upgrade to the 2900 series so any experience gained on 2900 models would be advantageous. A competitive salary is coupled with an attractive benefits package which includes LV's, 4 weeks vacation and a subsidised mortgage.

Reference JC37/1

## OPERATIONS

Junior and Senior Operators with experience on IEM, UNIVAC Honeywell, Burroughs, NCR, ICL, DEC and PDP are required urgently. Listed below are a selection of our vacancies:— if you don't see one to suit you, call us to find out about the many others we currently have available.

IBM	SYS/3	Ops Super	4 yrs	£6000
IBM	DOS	Ops Super	4 yrs	£8000
IBM	OS	Ops Super	3 yrs	£5500
IBM	DOS	Shift Ldr	3 yrs	£5600
IBM	DOS	Snr Ops	2 yrs	£5300
IBM	OS	Shift Ldr	3 yrs	£5400
IBM	OS	Snr Ope	2 yrs	£4500
IBM	OS	Operator	1 yr	£4300
ICL	GII	Shift Ldr	2 yrs	£4500
ICL	GII	Snr Ops	2 yrs	£4300
ICL	GIII	Operator	1 yr	£4500
ICL	Manual	Snr Op	1 yr	£3800
ICL	2900	Operator	1 yr	£3600
Burroughs	MCP	Operator	2 yrs	£5000
Burroughs	MCPV	Operator	1½ yrs	£3600
Burroughs	MCP	Operator	1-2 yrs	£4500
Honeywell	OS2000	Operator	2 yrs	£4500
Honeywell	OS2000	Operator	1 yr	£4000
Univac	EXEC8	Operator	5 months	£3500
Univac	EXEC8	Operator	2 yrs	£4500

## RPG II PROGRAMMERS

## London (All Areas) £4000 to £6500+

We have a varied selection of vacancies in all areas of London covering a wide range of programming experience. These positions cover a broad spectrum of the Computer Industry, ranging from large well established software consultancies and manufacturing companies to small retailing and publishing concerns.

The equipment in use includes all the IBM SYSTEM 3 series and ICL 1900 and 2900 mainframes.

All the companies offer attractive starting salaries, and fringe benefits vary from Free Lunches and Season Ticket Loans to Travelling Expenses and Annual Bonuses.

Reference JC37/2

## DATA CONTROLLERS

We have many positions, both Junior & Senior, at salaries up to £5000.

## RECRUITMENT CONSULTANTS

## West End

£6500 to £9000+

We are looking for people with several distinct qualities to join our team of consultants; people with the desire to make money, with a flair for assessing and communicating with others, and with the drive to succeed by sheer hard work. In return for these qualities Datascene will offer an ideal opportunity to use current DP knowledge in a varied and fulfilling role, working with both clients and our own consultants on all aspects of recruitment. If you have experience within either Systems & Programming, or Operations, and would like more information, please call Phil Gascoigne.

Reference PG37/3

## SYSTEMS ANALYST

## City

£6500

A prominent company in the sports and leisure industry is seeking an ambitious young analyst to join a team involved in the expansion of its existing system and the development of new commercial projects.

The person they want is a go-ahead individual with an eye to the future wishing to fully utilise his talents and add to his experience and expertise. The successful applicant will have a programming background, preferably in COBOL, and a minimum of two years analysis experience.

In addition to an attractive starting salary the company offers a first rate benefits package and excellent working conditions.

Reference JC37/4

Datascene Recruitment Ltd  
Sceptre House  
169-173 Regent Street  
London W1R 7FB

**datascene** 01-439 7871  
24hour answer phone

IBM Systems Programmers £18,000 p.a.  
Holland

- MVS/JES2-MAS
- VM/370-CMS
- BTAM-TCAM-VTAM/SNA
- IMS-TSO-VSPC-RJE

For further details, write or contact Brian Bidder on 0734 791226 during office hours or on 0346 6365 during evenings or weekends.

2100 Datascene Datascene  
Wokingham RG11 1BB  
0344 6364 6365

370 Software Support CIS

## WELLTRADE INTERNATIONAL

Our clients have immediate vacancies for the following:

RTT 1 CW — 2 SYSTEMS ANALYSTS for the NEW YORK OFFICE of a German Bank. Candidates should have experience of Foreign Exchange Systems. SALARY RANGE £32,000.

RTT 2 CW — PROGRAMMERS — To work on the development of word processing systems. Candidates should have experience in one or more of the areas listed below.

Date Base Management, Language Interface, Utilities Support, Compiler Development, Text Editing.

In addition a knowledge of 8080 would be useful. SALARY RANGE 50-60 D.M.

RTT 3 CW — SENIOR SYSTEMS PROGRAMMERS — Candidates should possess knowledge of —

16M OS VSI or 2, VM 370, DS/MVS in both, CCW Programming experience for disks & drums.

In a different category our client also requires people with experience of systems, file applications and systems conversions using MVS JES3. SALARY RANGE 65-90,000 D.M.

RTT 4 CW — SENIOR SOFTWARE DEVELOPMENT MANAGER — with a number of years experience with a manufacturer in large mainframe software areas. SALARY RANGE 70-95,000 D.M.

RTT 5 CW — OPERATING SYSTEM DESIGNER — The successful candidate is likely to have Burroughs experience and will be able to relate user needs to operating system and language feature requirements. In addition it will be an advantage if he has translated such feature requirements into the design specs. for the development of operating systems in a high level language.

RTT 6 CW — SYSTEMS DESIGNERS — With experience of all aspects of the design of an X-25 based packet switching system. SALARY RANGE 95-110,000 D.M.

RTT 7 CW — MICRO-SYSTEMS SPECIALISTS SYSTEMS ENGINEERS — With experience of one or more of the following:

Systems architecture and hardware, Software design utilising Intel 8080.

The production of micro processor boards for industrial control applications.

Candidates should have a working knowledge of German. SALARY RANGE 45-70,000 D.M.

RTT 8 CW — FORTRAN PROGRAMMERS — With 4-5 years experience plus knowledge of one of the following:

Traffic Control Systems, Integrated Circuits, Quantity Surveying Applications.

Candidates should have a working knowledge of German. SALARY RANGE 45-70,000 D.M.

RTT 9 CW — PROJECT LEADERS & SYSTEMS ANALYSTS — For manufacturing company based in Aachen. Candidates should have experience in one or more of the following:

Factory data collection test stand, Process Monitoring/Control, Plant Management, Energy Management.

It is expected that in working in the areas listed above candidates will have gained knowledge of:

Real Time Systems, D.P. Systems, Drivers & Data Communications.

Candidates should have knowledge of German. SALARY RANGE 45-70,000 D.M.

Vacancy Ref. No. 1 RTT2CW through RTT8CW are located in a beautiful part of Southern Germany close to lake and Alpine scenery.

Please write or telephone, quoting appropriate reference, to Morris Steer, Welltrade International Ltd., Redgeland House, 165 Dyke Road, Hove, Sussex BN3 1TL Tel: 0273 (24921).

## Wrangler

FURTHER APPOINTMENTS  
APPEAR ON PAGES

38, 39, 40, 41, 42, 43, 44, 45,  
46, 47, 48, 49, 50, 51, 52, 53,  
54, 55, 56, 57, 58, 59, 60, 61,  
62, 63.

COMPUTER  
OPERATOR

Our internal promotion Blue Bell Apparel Limited manufacturers of Wrangler Leisure Wear have a vacancy for a computer operator.

We are looking for someone who has an interest in programming and one/two years experience of an IBM System 3 or smaller commercial computer. You will be part of a small and friendly team, with the opportunity to learn and develop your skills in a rapidly expanding international company.

Remuneration and other terms of employment are a commensurate with experience in a large rapidly expanding international company.

Applications to: Mrs. Alison Ogden, Personnel Manager, Blue Bell Apparel Ltd., Redgeland House, Tel: Wokingham (018) 6007 441 2088.

2100 Datascene Datascene  
Wokingham RG11 1BB  
0344 6364 6365

MANAGEMENT &  
EXECUTIVE SELECTION

telephone 01-637 9611

## AES WORDPLEX

## Midlands/ Home Counties

## Libra Computing Limited

## Sales People

c £12-£14K + Car

Selling equipment in the forefront of technology requires salesmen who are experienced in the computer market of today and who are fully aware of the potential tomorrow.

Due to the recent merger of Britain's foremost word processing companies now forming the market leader in this rapidly expanding industry, new and exciting opportunities have been created for sales people to expand the current sales force.

To be eligible for this position you will have a proven sales record obtained in the data processing or office products industry. Working in the areas stated above, you will be responsible for existing accounts as well as developing new business.

The rewards are a high basic salary, a first class commission scheme, company car and our client is the "new force" in the industry today the promotional prospects are excellent.

## SYSTEMS ANALYST

c £4-£4½K + car

Due to the current expansion a number of vacancies exist for Trainer Demonstrators with experience in the word/office products industry to support the sales team in the development of new and existing business.

The qualities required are a presentable appearance, the ability to be able to communicate effectively, some typing skills and the drive and ambition to develop your career further as opportunities exist to move over into areas of general management and systems specialisation.

Applicants without previous experience in these fields but with potential will also be given every consideration.

Contact Fay Ogilvie

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637 9611

## London

to £7K

## Senior Systems Analyst

Libra is a small and innovative software house, a subsidiary within the Guinness group, specialising in Market Research Analysis, and specialised computer software.

They are currently installing a small but powerful Herrie virtual memory computer system at their Bayswater offices.

On behalf of our client we are seeking a mature and adaptable ANALYST who wishes to remain involved in the techniques of programming.

Your experience should include implementation to at least one complete system, and a good usage of IBM Assembler. Demonstrated supervisory ability is essential.

Useful additional experience would include Fortran, systems or software programming, and training or sales background, whilst knowledge of market research, interactive processing, mini, or ICL equipment would be an added bonus.

The appointment is at executive level, and will include supervision of several technical staff, as well as analysis and programming.

Benefits include pension scheme, life assurance scheme, profit sharing and LV.

Applications should be addressed to DEREK PEARSON at the address below in the first instance.

Contact Derek Pearson

MANAGEMENT &  
EXECUTIVE SELECTION

## The place?

Aberdeen, the Granite City, is almost certainly one of the most beautiful cities in Europe. It is surrounded by the scenic attractions of the Scottish Highlands and has for many years been one of the United Kingdom's main fishing ports. But now with the advent of North Sea Oil, it is an even more prosperous and thriving community. Aberdeen is a port, a University town, an excellent shopping centre, a forward looking city with a great future.

## The life?

All year round Aberdeen is a hive of activity. Not goes for anything from mountain climbing to music making. It is only to be expected from the city that gave Scotland her first painter, her first performed play, her first poet, and all of Britain its first University course in Medicinal A city of sport, of the arts, of learning—a city with a rich past and an equally rich present.

## The challenge?

Our climate is generally good, with hot summers that have made Aberdeen a popular holiday resort and sharp winters, which are an advantage for the winter sportsman or woman. We are within easy reach of Aviemore and Glenshee, with the Grampian mountains on the doorstep.

## The employer?

The North of Scotland Hydro-Electric Board is responsible for supplying electricity to over 25% of the landmass of Great Britain. We know our business and do our job well. Our accounting and engineering departments make extensive use of our computers and are now expanding their computer based activities.

## The money?

The panel opposite gives an idea of the salary scales we are offering, but the actual salary will depend entirely on you. Your experience and ability are what we need and we are willing to pay for it. If you are looking for a real career with opportunities for advancement in a growing organisation look no further. Assistance will be given with moving expenses where necessary.

## The challenge?

We are now expanding our computer centre in Aberdeen and will be installing a large new configuration with a comprehensive terminal network to replace our existing ICL System 4 computers. Engineering programs extend through generation, transmission and distribution. Commercial activity—apart from billing, payroll and accounting—will be extensively developed into management accounting and enquiry processing. A challenge indeed, but if you think you can meet it read on.

## Commercial

## SENIOR SYSTEMS DESIGNER

£3985-£6130  
Minimum experience 2 years.  
Knowledge of business



# KNIGHTS KNOW HOW

DATA PROCESSING CONSULTANTS SINCE 1970

## MINI PROG — LONDON to £6,000

A bright future here, within computer services division of major financial and banking group for persons wishing to work on POP II mini computers. Company requires 2 persons at varying levels (i.e. 1-3 years), POP II, BASIC + and RTTS experience but will consider good mainframe and high level language to be trained.

- Brand new projects of financial and commercial nature.
- Opportunity to go onto MINIS.
- Good future and bright career.
- Benefits include sub mortgage after statutory period, profit share, flexi-time, etc.

REF. 1769

## PROGRAMMER — CITY £5,000c

Famous world-wide banking organisation, retaining amongst its various computers, IBM 370 hardware with T.P. monitor, has a rare opportunity for a programmer with good COBOL experience. Initially he/she will be involved in all aspects of programming but with a view to go into analysis and eventually be trained as a systems analyst.

- Long-term career prospects.
- Excellent training facilities.
- Fringe benefits include CHEAP MORTGAGE, subsidised restaurant, non-contributory pension and S.I.T.S.

REF. 1771

## PROGRAMMER — HANTS. £5,000

Due to expansion and to cater for future needs the O.P. division seeks programmers to join their small friendly teams. They retain IBM 370 hardware and are seeking programmers ideally with at least 18 months' PL/I experience but are prepared to train COBOL, FORTRAN or ASSEMBLER programmers who would like to learn a new language.

- Excellent prospects
- Full training in PL/I
- Subsidised MORTGAGE after statutory period
- Super working conditions including staff restaurant and non-contributory pension scheme

REF. 1779

## SYSTEMS ANALYST — LONDON £7,500

Exciting and challenging opportunity awaits a systems analyst within the worldwide and prestigious company. Ideal applicant will have programming background in COBOL and ASSEMBLER and at least 2 years' systems experience. Our client is awaiting the installation of IBM 370 in October and this is a superb opportunity to work in a brand new area on new projects.

- Company offers
- Highly progressive organisation.
- Continued development with a well planned schedule.
- Excellent benefits including cheap travel
- Good promotional prospects

REF. 1764

## PROGRAMMER — ESSEX £5,000 + CO. CAR

Leading clothing manufacturer seeks prog with at least 18 months' exp. The O.P. dept at present is quite small but company is growing rapidly. Successful applicant will act as ASSISTANT to the P.M. This is a superb opportunity for young ambitious person wishing to develop with the company. They retain BURROUGHS hardware but will consider ANY HARWARE EXPERIENCE. If you want a CHALLENGE telephone now.

- Exciting growth potential.
- Highly progressive organisation.
- Excellent career prospects.
- RELOCATION expenses.

REF. 1732

## PROGRAMMER — LONDON £5,500

Ours to development of advanced computer systems, successful O.P. services department seeks to boost its programming team. Retaining large ICL 1900 equipment they offer excellent opportunities for persons with minimum COBOL and PL/I experience.

- Training on IDMS Database.
- Development to analysis.
- Opportunities to join at senior level.
- Applications in various areas providing an absorbing and interesting career.
- EXCELLENT perks include FLEXI hours and 6 WEEKS' HOLIDAYS.

REF. 1780

## JUNIOR PROG — LONDON £6,000

Multi-national company retaining large IBM 370 hardware requires programmers with at least 1-2 months' ASSEMBLER experience, to join a highly professional team. They are currently developing a major sophisticated on-line system.

- Company offers
- Highly progressive organisation.
- Continued development with a well planned schedule.
- Excellent benefits including cheap travel
- Good promotional prospects

REF. 1764

## PROGRAMMERS — SOUTH COAST £6,500

Major expanding British company seeks COBOL programmers, with minimum 2 years' experience. Retaining large IBM 370 and 3031, they are currently developing PL/I database and CICS and have on-going training and development programmes financed with substantial budget.

- Company offers
- Prestige, coastal location.
- Good training and excellent scope to move into systems.
- Full RELOCATION expenses.
- MORTGAGE assistance, free life insurance, non-contributory pension scheme

REF. 1732

## PROGRAMMER — HOLLAND £11,000

International company manufacturing sophisticated technical products for world-wide distribution seeks programmer for exciting newly-created position. Company have recently installed POP II using BASIC + and consequently require person with good knowledge of the same, with a good personality and strong desire to accept a challenge.

- Prestige company with good American backing.
- Good deal of development work using integrated database.
- EXCELLENT perks include FLEXI hours and 6 WEEKS' HOLIDAYS.

REF. 1764

## MINI PROGS — LONDON/H. COUNTIES £6,500 NEQ

Programmer company operating on a global scale, requiring person with 1-3 years' experience ANY MINI ASSEMBLER to work in their modern offices. During large DUC POP II equipment and expanding at a rapid rate, they have wide range of on-going projects both in hardware and software areas.

- Extensive training in up to date technology
- Excellent career opportunities for training & RTTS, BASIC and RTTS
- Opportunity for further travel

REF. 1718

## PROGRAMMER — CITY £6,000

Established Merchant Bank has opportunity for person with COBOL and PL/I experience to start primarily as a programmer but also be involved with analysis. This position is in the "front line" area but company will consider any good commercial background. O.L/I Database is currently being developed, for which FULL TRAINING will be given.

- Large budget allocated for training purpose
- Variety of new development including O.L/I
- First-class opportunity to follow an exciting career path
- O.L/I MORTGAGE and insurance, long-term loans, savings, bank scheme and soft sport, social club

REF. 1718

## MINI PROG — KENT to £6,500

Our client is an international company and clinic in beautiful countryside. The job programme with 12 months' ITC PL/I + BASIC + experience. The hardware is fully installed, offering new development at minimum tuning and financial stress.

- Prestige company with good American backing.
- Good deal of development work using integrated database.
- EXCELLENT perks include FLEXI hours and 6 WEEKS' HOLIDAYS.

REF. 1764

For further details ring our London Office—01-734 0152/3010 (24 hours)

## CONTRACT DIVISION

### U.K.

IBM CICS ASS + PL/I  
IBM IMS COBOL  
IBM MVS COBOL  
IBM IMS PL/I  
IBM OS COBOL  
IBM OS COBOL TSO  
AN/PROG IBM OS COBOL TSO  
ICL 2903 COBOL

LONDON  
HERTS  
BEDS  
S. COAST  
S. COAST  
HERTS  
BEDS  
MIDDX

£230 p.w.  
£230 p.w.  
£230 p.w.  
£250 p.w.  
£200 p.w.  
£200 p.w.  
£180 p.w.

HONEYWELL 6000 COBOL  
BURROUGHS 6700 COBOL  
POP FORTRAN RSXII  
POP MACRO II + CORAL  
POP MACRO II RSXII  
POP MACRO II RSXII  
MINI, CORAL MACRO RTLII  
OR ASS

SURREY  
BERKS  
MIDDX  
LONDON  
HERTS  
HERTS

£210 p.w.  
£200 p.w.  
£230 p.w.  
£230 p.w.  
£220 p.w.  
£220 p.w.

### OVERSEAS

SYSTEMS PROG CICS PL/1  
+ ASSEMBLER  
IBM MARK IV  
2900 VMEB/VMEK  
HONEYWELL LEVEL 61/  
OR LEVEL 62

HOLLAND  
HOLLAND  
LUXEMBURG  
HOLLAND

£400 p.w.  
£400 p.w.  
£350 p.w.  
£320 p.w.

SYST 10 ASSEMBLER  
POP FORTRAN KN OF FRENCH  
AVANTAGE  
SIEMENS TELEPROCESSING  
ASSEMBLER + COBOL  
UNIVAC OMS

HOLLAND  
PARIS  
LUXEMBURG  
HOLLAND

£350 p.w.  
£400 p.w.  
£350 p.w.  
£370 p.w.

Phone now for immediate and future contracts  
Ring Christine Kay / David Hayton. Tel. No: 01-734 0152 (24 hours)

## KNIGHT PROGRAMMING SUPPORT LIMITED

27 NOEL STREET, LONDON W1 TELEPHONE: 01-734 0152/6 (24 HOURS)  
OFFICES: AMSTERDAM, PARIS, MANCHESTER, BIRMINGHAM

## Two top D.P. Professionals for sophisticated & complex installation

Cryoplants, a highly successful member company of BOC International Group, are world leaders in the design and manufacture of low temperature process plant. The Company has achieved a significant and continuing record of success in both home and worldwide export markets.

Strong leadership and management skills are essential, as is the ability to play a key role in providing a first class service to users of on-line systems. The position should appeal to more women, aged between 26 and 35, ready for their first major management role.

### Programming Supervisor

£5800-£7000 p.a.

We are looking for a senior programmer who is seeking to consolidate his supervisory experience. He or she will control in-house production, maintain staff, costs, staff and budget price control applications software in-house. Extensive experience of IBM OS COBOL is essential and experience within a complex mini-computer environment highly desirable. Exposure to high level computer programming skills would be an advantage.

These positions offer a stimulating and interesting opportunity in continuing an ambitious development programme. Career prospects within the BOC Group are first class for suitable applicants and attractive salaries will be paid according to experience.

The Company is located in Heath London and assistance will be forthcoming with relocation. To apply please write or telephone:



1976

The Personnel Manager,  
Cryoplants Limited,  
Angel Road,  
Edmonton N19 3RW  
Tel. 01-8031381

**Cryoplants**

## ADVANCED APPLICATIONS London, W.1

Due to an increasing volume of development work, our clients (a major West End installation using ICL 2900, 1900 and minis) have asked us to recruit for several career openings. These offer

- database, real time and communications applications
- the technical challenge of large-scale systems
- training in modern techniques
- good working environment (new offices, staff restaurant)
- sound career path and advancement prospects

### SYSTEMS ANALYSTS £6000-£7000

These posts will interest analysts with limited experience at the lower end of the bracket to more experienced practitioners at the upper end. Your background could be on any applications and on any hardware.

(Ref. 672)

### SOFTWARE PROGRAMMERS £6200

Here's an opportunity to learn about VME/B and IDMS, and to use MAC and TP techniques. This opening will appeal to programmers who have worked in a software or systems programming role on ANY MAINFRAME.

(Ref. 800)

### APPLICATIONS PROGRAMMERS Up to £5600

Do you want to gain experience of the latest ICL hardware and software at a professionally-run installation? Would database and real-time experience enhance your career prospects? You should have had two years or so as a programmer, ideally including COBOL. However, if you have used another mainframe language, retraining will be provided.

(Ref. 686)

### POTENTIAL SYSTEMS ANALYSTS £4500-£5600

This is a rare chance for a programmer or analyst / programmer to move to Systems Analysis, and to play a meaningful role after training. Candidates should have a background of at least three years' programming, or a Computer Science degree, or a recognised analysis diploma. (Ref. 880) Please ring us for a confidential exchange of information. If more convenient, leave a message on our answering machine after hours end, we'll phone you at home.

(Ref. 880)

### EDP SYSTEMS 01-637 5796

52-53 Margaret St, London W1N 7FF

EDP SYSTEMS 01-637 5796



Data Processing Recruitment Consultants

## Mini Analysts+Programmers Holland

Salaries: £9.5-15K.

Our Client is a major International Systems and Software Development Group recognised as Market leaders in their field. Owing to continued expansion in a wide variety of applications areas including Data Communications, Message Switching, Computer Networking and Mini Computer Software, a significant number of experienced permanent personnel are urgently required. Emphasis will be placed on technical achievement and in-depth experience in the areas of activity outlined above. Whilst a degree equivalent qualification in either Computer Science or Mathematics is desirable, significant relevant experience will be considered in lieu.

Of essence is a solid Assembler background within a Mini-computer environment. Project locations throughout the Benelux provide a wide and interesting environment which include Amsterdam, The Hague and Rotterdam. Of prime importance is demonstrable enthusiasm to relocate to the Netherlands for an extended period. Every assistance will be given in relocation, including cost of removal of all personal effects, initial accommodation expenses and a resettlement advance.

Interviews will be held in London within 14 days and offers will subsequently be made inside one week.

Ref. 674

## Main-Frame+Mini Programmers Greater Manchester

Salaries: £6-9.5K (a.a.e.)

A very prestige client with headquarters in London and regional offices located in Cheshire and throughout Europe urgently requires the following: Real Time and on-line Programmers, Systems and Data base designers and compiler specialists with 2-5 years experience.

Of particular interest would be people with relevant experience in one or more of the following: IBM or ICL with Assembler, PL/I or COBOL and Ferranti, DEC

with Basic, RTL II or Coral. Also IMS or similar and Data Base design personnel are urgently sought. The scope of projects is both broad and demanding and certainly in keeping with the prestige of this client. You will play an important role in project development and the opportunity to enhance your technical expertise is one of the attributes of working with this reputable group. Fringe benefits are well above average and full relocation expenses will of course be met.

with Basic, RTL II or Coral. Also IMS or similar and Data Base design personnel are urgently sought.

The scope of projects is both broad and demanding and certainly in keeping with the prestige of this client. You will play an important role in project development and the opportunity to enhance your technical expertise is one of the attributes of working with this reputable group. Fringe benefits are well above average and full relocation expenses will of course be met.

## Freelance IMS PL/ Amsterdam

£400 p.w. Min. 6 months.

A Dutch client has an urgent requirement for two costs and tender assistance in location of program modules in Amsterdam. They will also consider provision of paid temporary or commitment in the initial weeks of settling in. Applications will be verified, interesting and above all demanding. This contract is for a minimum of 6 months but may well be extended. Brief interviews will be held as soon as you can be made available to be held in London or Amsterdam.

Ref. 674

## IBM T.P. or Database